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ABSTRACT

National Longitudinal Surveys of Labor Force Experience (NLS) data were used to describe those people who work outside the traditional 9:00 A.M. to 5:00 P.M. work day. Depending on the approximate time of day they worked, respondents were classified into four categories of workers: day, evening, night, and split shift (working hours interrupted by a period of nonworking hours). The majority, day workers, were in general more prestigious, well-paid positions which require more education. Females or young persons (18-20) comprised more of the shorter hour, lower wage evening or split shift workers. This group, as well as night workers, were more likely to live in urban areas outside the South and were employed in manufacturing, transportation, service, wholesale, and retail sales industries. Evening workers were more likely to be unionized. Night shift workers had worked at their jobs approximately as long as day workers. Almost no women worked in agriculture and construction while transportation and public utilities tend to employ females during the day but men at night. The opposite was characteristic of wholesale and retail sales, except that young men (19-29) often worked at night. Finance and insurance industries employed men more often on split shifts, employing females and young men during the day. Shift worker personnel and job related characteristics appear to be a function of both industry and occupation. (MEK)

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# Shift Workers: A Descriptive Analysis of Worker Characteristics

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There has been a large increase in the number of workers on late shifts in the past twenty years, and in May 1977, there were nearly 7 million full time wage and salary workers on late shifts.[1] According to a report from United Press International on May 10, 1979, factory production in some companies is being moved to later shifts in order to take advantage of off-peak power rates. As energy becomes more expensive, this trend is expected to continue, and more workers will be asked to work outside the traditional hours. Who works late shifts? Will a movement to late shifts precipitated by the energy crisis affect those groups of workers who are typically disadvantaged in the labor force?

Shift workers have received scant attention from labor economists.[2] This study exploits data from the National Longitudinal Surveys of Labor Force Experience (NLS) to describe those people who work outside the traditional 9 a.m. to 5 p.m. work day. NLS data, which derive from repeated detailed interviews with 20,000 members of the U.S. work force, allow for rather specific descriptions of large groups of workers. Responses about shift work were elicited from each of four NLS cohorts: men who were 50 to 64 years of age and young men who were 19 to 29 years of age in 1971, and women who were 35 to 49 and young women who were 18 to 28 in 1972. For convenience, these groups will hereafter be referred to as "men," "women," "boys," and "girls."

Respondents who were employed at the interview date were asked if they worked the same hours each day and the same days each week, and those who said yes were next asked when they worked: those whose usual working day fell within the traditional 9 a.m. - 5 p.m. hours are here called "day workers." Those who

reported most of their hours between 6 p.m. and midnight are labelled "evening shift workers," and those who worked mostly between midnight and 6 a.m. are called "night shift workers." A fourth category, "split shift workers," describes those whose working hours were interrupted by a period of non-working hours.

Cohort by Shift

Traditional day workers were far more numerous in all cohorts, with diminishing proportions in the evening, night, and split shifts, respectively. Throughout this study we will compare the experience of this vast majority of day workers -- 84 percent or better for all cohorts -- to that of their counterparts who worked between 6 p.m. and 6 a.m. and whom we label "shift workers."[3]

Industry by Shift

Table 1 shows how workers in each cohort are distributed by shift within each industry. Asterisks indicate that the percentages of workers on the designated shift in that particular industry differs significantly from the mean percentage of workers on that shift for the total cohort.

In no industry is the proportion of any cohort working on the day shift smaller than two-thirds. It is this low among young men in the personal service industries, however, reflecting higher-than-average employment of young men in this industry division on the evening shift. Lower-than-average proportions of day shift workers occur also among both groups of males in manufacturing, among the older males in transportation and among both groups of females in trade. The latter groups have disproportionately high numbers of evening and split shift workers.

TABLE 1

Shifts by Industry for All Cohorts (Men and Boys 1971, Women and Girls 1972)

| Characteristic | | Shift | | | |
|---|---|---|---|---|---|
| | | Day | Evening | Night | Split |
| TOTAL | MEN (N=2540) | 88.1 | 6.3 | 3.6 | 2.0 |
| | BOYS (N=2736) | 83.7 | 9.5 | 4.0 | 2.8 |
| | WOMEN (N=2031) | 88.7 | 6.7 | 2.4 | 2.2 |
| | GIRLS (N=1941) | 86.6 | 9.1 | 2.5 | 1.8 |
| INDUSTRY | | | | | |
| AGRICULTURE | Men | 95.7**** | 0 | 1.6 | 2.7 |
| | Boys | 97.8**** | 1.1**** | 0 | 1.1 |
| | Women | - | - | - | - |
| | Girls | - | - | - | - |
| CONSTRUCTION | Men | 99.3**** | .7**** | 0 | 0 |
| | Boys | 97.8**** | 1.7**** | 0 | .5**** |
| | Women | - | - | - | - |
| | Girls | - | - | - | - |
| MANUFACTURING | Men | 85.6* | 8.8** | 3.7 | 1.9 |
| | Boys | 80.2** | 13.0*** | 5.7* | 1.1**** |
| | Women | 87.2 | 8.8 | 3.4 | .7*** |
| | Girls | 85.5 | 9.9 | 4.2 | .4*** |
| TRANSPORTATION PUBLIC UTILITIES | Men | 82.7** | 8.1 | 6.8** | 2.4 |
| | Boys | 80.2 | 7.4 | 10.8*** | 1.6 |
| | Women | 90.3 | 3.4 | 0 | 6.4 |
| | Girls | 95.1**** | 3.1*** | 0 | 1.8 |
| WHOLESALE, RETAIL | Men | 92.5*** | 2.6**** | 3.3 | 1.6 |
| | Boys | 82.2 | 10.5 | 2.0*** | 5.3** |
| | Women | 81.1**** | 10.2** | 0 | 5.4** |
| | Girls | 74.4**** | 15.8*** | 3.5 | 6.3*** |
| FINANCE, INSURANCE | Men | 83.8 | 5.8 | 1.3* | 9.1** |
| | Boys | 92.4*** | 3.7*** | 1.3** | 2.4 |
| | Women | 94.5*** | 3.3* | 3.3 | 1.2 |
| | Girls | 99.8**** | .2**** | 0 | 0 |
| BUSINESS AND REPAIR SERVICES | Men | 88.3 | 8.7 | 2.4 | 0.6 |
| | Boys | 84.1 | 12.1 | 3.8 | 0 |
| | Women | - | - | - | - |
| | Girls | 84.3 | 14.7 | 1.0 | 0 |

TABLE 1 (continued)

| Characteristic | | Shift | | | |
|---|---|---|---|---|---|
| | | Day | Evening | Night | Split |
| PERSONAL SERVICE | Men | 83.9 | 7.2 | 4.5 | 4.4 |
| | Boys | 67.7** | 17.2 | 6.5 | 8.6 |
| | Women | 92.1* | 6.6 | 0 | 5.1 |
| | Girls | 84.5 | 9.4 | 3.7 | 2.4 |
| PROFESSIONAL | Men | 89.1 | 5.9 | 3.7 | 1.2 |
| | Boys | 83.5 | 9.0 | 2.0** | 5.5** |
| | Women | 91.8** | 4.1*** | 2.7 | 1.4 |
| | Girls | 87.1 | 9.3 | 2.1 | 1.5 |
| PUBLIC ADMINISTRATION | Men | 89.2 | 5.8 | 3.5 | 1.5 |
| | Boys | 79.3 | 9.7 | 7.5 | 3.5 |
| | Women | 90.0 | 5.7 | 1.6 | 2.7 |
| | Girls | 93.2*** | 5.7 | 1.1 | 0 |

Asterisks indicate significant differences from the percent of all workers on that shift by cohort.

* P = .01
** P = .05
*** P = .01
**** P = .001

\- Dashes indicate a sample size less than 30 for a particular industry.

Mean percentages in the table are weighted to adjust for the over-sampling of blacks.

N = number of respondents from which the weighted percentage distributions have been calculated.

In some industries, work is almost exclusively on the day shift -- agriculture and construction, for instance -- in which over 95 percent of the male workers work during the day (there are too few females in those industries for reliable estimates). Other industries in which above-average proportions of workers are on the day shift are trade (for the men only), finance (for boys, girls and women), and public administration (for girls).

It is clear from the foregoing that there are age and sex differences in work-shift patterns that prevail in different industries. The most obvious example is trade, in which disproportionately large numbers of older men but disproportionately small numbers of women and girls work the day shift. To mention but one other illustration, night work occurs with above average frequency among both groups of males in transportation and public utilities, but not at all among women in that industry division.

Occupation by Shift

Within each industry are a variety of occupations at various status levels. Table 2 illustrates how workers are distributed by occupation across shifts. A significantly larger proportion of people in the professional occupations were day workers, and fewer than average worked in the evening. The proportion of professional workers on the night shift, however, depended on the sex of the worker. Men and boys in the professional occupations appeared in smaller than average proportions on the night shift, but women and girls in the professions appeared on the night shift in average numbers, largely because nursing was the only profession significantly represented on the night shift.

TABLE 2

Shifts by Occupation for All Cohorts (Men and Boys 1971, Women and Girls 1971)

| Characteristic | | Shift | | | |
|---|---|---|---|---|---|
| | | Day | Evening | Night | Split |
| TOTAL | MEN (N=2540) | 88.1 | 6.3 | 3.6 | 2.0 |
| | BOYS (N=2736) | 83.7 | 9.5 | 4.0 | 2.8 |
| | WOMEN (N=2031) | 88.7 | 6.7 | 2.4 | 2.2 |
| | GIRLS (N=1941) | 86.6 | 9.1 | 2.5 | 1.8 |
| OCCUPATION | | | | | |
| PROFESSIONAL | Men | 98.1**** | 1.3**** | .1**** | .5*** |
| | Boys | 93.3**** | 4.5**** | .5**** | 1.7 |
| | Women | 92.5** | 4.2** | 3.3 | 0 |
| | Girls | 89.7* | 6.4* | 2.5 | 1.4 |
| MANAGERIAL | Men | 95.1**** | 3.1*** | .4**** | 1.4 |
| | Boys | 89.3** | 4.8*** | 1.9** | 4.0 |
| | Women | 92.6 | 3.2* | 0 | 4.1 |
| | Girls | 87.1 | 7.5 | 1.1 | 4.2 |
| CLERICAL | Men | 86.4 | 8.9 | 4.6 | 0 |
| | Boys | 81.2 | 11.7 | 4.4 | 2.7 |
| | Women | 94.5**** | 2.6**** | .4**** | 2.5 |
| | Girls | 92.8**** | 5.8**** | .3**** | 1.1 |
| SALES | Men | 88.1 | 2.7* | 0 | 9.2** |
| | Boys | 83.2 | 8.6 | 2.7 | 5.5 |
| | Women | 82.8 | 7.8 | 0 | 9.3** |
| | Girls | 75.7** | 11.3 | 1.6 | 11.4** |
| CRAFTSMEN | Men | 87.9 | 7.0 | 3.4 | 1.7 |
| | Boys | 86.8* | 7.6 | 4.9 | .6**** |
| | Women | 80.6 | 18.4 | 1.0 | 0 |
| | Girls | - | - | - | - |
| OPERATIVE | Men | 84.5** | 7.0 | 5.6** | 2.8 |
| | Boys | 78.8* | 12.7** | 5.5 | 3.0 |
| | Women | 83.6** | 10.5** | 4.2 | 1.6 |
| | Girls | 76.2**** | 14.7** | 7.8*** | 1.3 |
| PRIVATE SERVICE | Men | - | - | - | - |
| | Boys | - | - | - | - |
| | Women | 97.6**** | 2.1**** | 0 | .4*** |
| | Girls | 88.7 | 6.0 | 2.5 | 2.8 |

TABLE 2 (continued)

| Characteristic | | Shift | | | |
|---|---|---|---|---|---|
| | | Day | Evening | Night | Split |
| SERVICE | Men | 69.3**** | 16.3**** | 10.8** | 3.7 |
| | Boys | 46.5**** | 35.3**** | 8.7** | 9.5*** |
| | Women | 71.8**** | 18.3**** | 7.3**** | 2.5 |
| | Girls | 66.8**** | 23.3**** | 7.7*** | 2.2 |
| FARM LABOR | Men | 95.9*** | 0 | 0 | 4.1 |
| | Boys | 96.5**** | 1.7**** | 0 | 1.7 |
| | Women | - | - | - | - |
| | Girls | - | - | - | - |
| LABOR | Men | 88.9 | 5.8 | 4.7 | .5*** |
| | Boys | 85.2 | 6.3** | 6.2 | 2.3 |
| | Women | - | - | - | - |
| | Girls | - | - | - | - |

Asterisks indicate significant differences from the percent of all workers on that shift by cohort.

* P = .01
** P = .05
*** P = .01
**** P = .001

\- Dashes indicate a sample size less than 30 for a particular occupation.

Mean percentages in the table are weighted to adjust for the over-sampling of blacks.

N = number of respondents from which the weighted percentage distributions have been calculated.

In the managerial occupations, a significantly larger proportion of men and boys were day workers, and fewer worked an evening or night shift compared to the average for workers in each cohort. In the clerical occupations, it appeared that shift assignment was a function of the sex of the worker. Above average percentages of women and girls in clerical occupations worked days, and below average numbers worked evenings and nights; men and boys, however, were found in distributions not significantly different from the distribution across shifts for all occupations.

The sales occupations showed a higher percentage among all cohorts working on split shifts. In general the distribution in sales was comparable to averages for all other occupations, although there were significantly fewer girls working days and fewer men working evenings.

Distributions of craftsmen by shifts did not differ markedly from the distribution for all occupations in the men's and women's cohorts. However, more boys were employed as craftsmen during the day and fewer on split shifts than was true of all occupations. Among operatives (including miners, taxi drivers, welders, etc.) there were fewer people working days, and in most cases more working evenings and nights.

In private service occupations, only women and girls appeared in sufficient numbers for reliable analysis. The women varied significantly from the total distribution of workers across shifts insofar as more of them worked days -- 97.6 percent as opposed to 88.7 percent, the average for the women's cohort among all occupations.

Farm labor, as we have seen, is a daytime occupation, and as with general labor, no significant numbers of women and girls were found in it.

Among general workers, fewer boys worked evenings and fewer men worked split shifts than among laborers in all occupations.

Personal Characteristics

It is obvious from the above discussion that the higher level better paying occupations are found during the traditional working hours. It was intended to observe what differences might exist while holding occupation constant; however, the resulting cell sizes were unsufficient for reliable analysis. Nevertheless, since so little is known about shift workers, it is of interest to examine personal and job related characteristics without controlling for occupational differences.

Therefore, personal characteristics of workers are described in Table 3. Within each cohort day workers -- who represent the vast majority of workers -- are considered the norm; we focus on how workers on other shifts varied from their standard. In examining the table, the reader should remember that occupational distribution accounts for much of the significant characteristic differences between day and shift workers.[4]

The proportion of white and black workers was essentially the same among all shifts for the men. Among boys, however, more blacks worked the night shift and fewer worked split shifts. Similarly, among the women, the evening and night shifts showed a slightly higher percentage of blacks and the split shift showed slightly more whites. Among the girls' cohort, a higher percentage of blacks worked the evening shift.

Marital status differences across shift lines were appreciable. Fewer women who had never married were found working evening and night shifts, and fewer married men worked nights. Considerably lower percentages of married boys and girls were found on evening and split shifts.

TABLE 3

Personal Characteristics by Shift and Cohort (Men and Boys 1971, Women and Girls 1972)

| Characteristics | | Shift | | | |
|---|---|---|---|---|---|
| | | Day | Evening | Night | Split |
| % WHITE | Men | 91.5 | 90.1 | 85.6 | 87.0 |
| | Boys | 89.2 | 88.9 | 82.1* | 94.0* |
| | Women | 88.1 | 82.0* | 78.1* | 94.8* |
| | Girls | 88.8 | 83.1* | 86.5 | 92.6 |
| % MARRIED | Men | 89.9 | 86.4 | 79.0*** | 88.0 |
| | Boys | 62.3 | 50.4**** | 56.2 | 41.5**** |
| | Women | 74.6 | 77.3 | 75.4 | 80.0 |
| | Girls | 51.4 | 34.9**** | 38.9* | 19.0**** |
| % NEVER MARRIED | Men | 2.5 | 6.2* | 5.9 | 4.1 |
| | Boys | 33.5 | 45.9**** | 36.2 | 55.3**** |
| | Women | 7.2 | .3**** | .6**** | 5.3 |
| | Girls | 41.5 | 55.4**** | 47.0 | 58.4* |
| % NON-SOUTH RESIDENCE | Men | 69.2 | 75.1* | 81.7*** | 77.8 |
| | Boys | 66.6 | 72.9* | 75.9* | 71.3 |
| | Women | 67.1 | 73.6 | 80.0** | 71.3 |
| | Girls | 67.8 | 77.2*** | 60.9 | 80.5* |
| % URBAN RESIDENCE | Men | 65.4 | 77.3**** | 73.1 | 72.3 |
| | Boys | 65.5 | 70.6* | 77.1*** | 64.8 |
| | Women | 65.2 | 69.0 | 61.0 | 58.2 |
| | Girls | 71.1 | 59.0*** | 56.9* | 90.4**** |
| MEAN AGE | Men | 55.8 | 56.2 | 55.8 | 55.6 |
| | Boys | 24.0 | 22.8**** | 23.4** | 22.2**** |
| | Women | 42.3 | 42.5 | 42.8 | 42.0 |
| | Girls | 22.8 | 21.7**** | 23.1 | 21.8** |
| MEAN EDUCATION | Men | 10.3 | 9.7** | 9.7** | 10.1 |
| | Boys | 12.8 | 12.5** | 12.5 | 13.3** |
| | Women | 11.8 | 10.3*** | 10.6* | 11.2* |
| | Girls | 12.8 | 12.3**** | 11.9*** | 12.9 |
| % OF SHIFT ENROLLED IN SCHOOL | Boys | 14 | 37**** | 26*** | 47**** |
| | Girls | 13 | 31**** | 39*** | 42**** |

TABLE 3 (continued)

| Characteristic | | Shift | | | |
|---|---|---|---|---|---|
| | | Day | Evening | Night | Split |
| % WITH HEALTH PROBLEMS | Men | 18.4 | 19.3 | 19.6 | 18.6 |
| | Boys | 6.7 | 9.6 | 7.9 | 5.3 |
| | Women | 10.6 | 14.5 | 13.6 | 16.7 |
| | Girls | NA | NA | NA | NA |
| MEAN ROTTER INDEX | Men | 22.6 | 23.1 | 25.6**** | 21.4 |
| | Boys | 22.6 | 22.3 | 22.3 | 23.3 |
| | Women | 23.6 | 24.9** | 24.0 | 23.6 |
| | Girls | NA | NA | NA | NA |
| MEAN PARENTAL SOCIO-ECONOMIC STATUS | Boys | 104 | 104 | 100** | 113**** |
| | Girls | 107 | 102*** | 97** | 113 |
| MEAN NUMBER DEPENDENTS | Men | .9 | .7** | .9 | .9 |
| | Boys | .9 | .7*** | .8 | .4**** |
| | Women | 1.9 | 2.3*** | 2.6*** | 2.5** |
| | Girls | .5 | .6 | .8** | .4 |
| % WITH CHILDREN UNDER 18 | Women | 64.6 | 70.7 | 66.7 | 80.3** |
| | Girls | 29.9 | 33.0 | 49.0*** | 24.8 |
| CHILD CARE ARRANGEMENTS | Women | | | | |
| % at home by father | | 4.0 | 44.0**** | 58.1**** | 8.9 |
| % at home by old sibling | | 5.8 | 22.0**** | 9.4 | 7.0 |
| % child looks after self | | 29.6 | 13.5**** | 13.9** | 27.8 |
| % mother cares for after school | | 38.0 | 4.9**** | 4.3**** | 27.4 |

Asterisks indicate significant differences from day shift characteristics.

* P = .1
** P = .05
*** P = .01
**** P = .001

Mean percentages in the table are weighted to adjust for the over-sampling of blacks.

Other researchers have observed that fewer married men and more who are divorced, separated, or widowed work night shifts. It is not clear whether night shift work causes marital difficulty, as some have argued,[5] or if unmarried men tend to choose it because they are unmarried.

Regional distribution by shift reveals that two-thirds of the day workers from each cohort lived outside the South. Recalling that manufacturing was an evening or night shift industry for men and boys, and considering that manufacturing firms were more concentrated outside the South, we expected to find a larger proportion of men and boys who lived outside the South working evening or night shifts. Congruent with this expectation, we found that, compared to day workers, significantly more evening and night shift workers had non-South residences -- three-quarters as opposed to two-thirds.

Approximately two-thirds of all workers were urban dwellers. Among men, a larger proportion of evening shift workers were urban dwellers, and among boys, a larger proportion of night and evening shift workers reported urban residence. Fewer girls working evenings and nights had urban residences, but over ninety percent of girls working split shifts did. Percentages of women urban dwellers did not vary significantly by shift.

Mean ages of men and women did not vary significantly according to shift either, but there were distinctions in age among boys and girls. The mean age among boys working days was twenty-four; for those working evenings and nights the mean age was twenty-three; those working split shifts had a mean age of twenty-two. The mean age of girls working days was twenty-three, while the mean age of girls working evening and split shifts was less than twenty-two.

In general, day shift workers also had more education than others. For men day workers, the mean was 10.3 years; for evening and night shift workers, it was 9.7. The boys working days had 12.8 years, more than the 12.5 years of evening workers, but less than the 13.3 years of split shift workers. Women working days had 11.8 mean years, significantly more than those on evening, night, and split shifts, who had 10.3, 10.6, and 11.2 years, respectively. Girls working days had 12.8 years, while those working evenings had 12.3 and those working nights had 11.9. In addition, significantly more of the girls and boys working evening, night and split shifts were enrolled in school.

There was no discernable difference between shifts in regard to health problems.

The Rotter scale extends from a low of 11 to a high of 44 with a higher score for those who perceive little or no control over the events in their lives. The mean Rotter score for day shift workers was 22.6, and the only significant variation was among men working nights, who had a mean of 25.6. The implication that day workers felt they have more control over their lives is supported by evidence from the women's cohort, where those working days had a mean Rotter score of 23.6 and those working evenings had 24.9.

On a variable for socioeconomic status of the parental family, the mean score of 113 among boys working split shifts was significantly higher than the mean of 104 for day shift workers and 100 for night shift workers.[6] Among girls, those on evening and night shifts had 102 and 97, markedly lower than the mean score of 107 for those working days.

Women working evening, night, and split shifts had the highest number of dependents -- 2.3, 2.6, and 2.5, respectively. In contrast, men and boys working evening shifts had markedly fewer dependents than those working days -- 0.7 as compared to 0.9. Among girls, those working night shifts

had the largest number of dependents, 0.8, and those working split shifts had the fewest, 0.4. Nearly half the girls working night shifts had children.

Two-thirds of women working days and four-fifths of those working split shifts had children under eighteen. Most of these women reported that they cared for their children after school or the children looked after themselves. Most women working evening and night shifts, however, relied on fathers or older siblings for child care. Because women working evening and night shifts had more children than those working days, it appears that they may have chosen to work nontraditional hours in order to take advantage of the least costly form of child care.

Table 4 shows job-related variations among workers by shift. In all cohorts, more evening shift workers received extra pay for overtime than did any others. Among men and boys, night shift workers received overtime pay more often than day workers and split shift workers were less likely to receive it.[7]

More evening workers in all cohorts had union representation: whereas 36.1 percent of the men working days had union representation, 70.4 percent of those working evenings did; 18.4 percent of the women working days had union representation, but 32.0 percent of those working evenings did. Significantly more men and boys who worked nights were represented by a union.

These differences in union membership are not surprising if we recall that manufacturing, characteristically a unionized industry, also tended to have much larger numbers of evening and night shift workers than other industries.

The question of perceived age discrimination produced only two variations from the norm -- among boys working split shifts, who felt themselves

TABLE 4

Job-Related Characteristics by Shift and Cohort (Men and Boys 1971, Women and Girls, 1972)

| Characteristic | | Shift | | | |
|---|---|---|---|---|---|
| | | Day | Evening | Night | Split |
| % EXTRA PAY FOR OVERTIME | Men | 54.8 | 75.8**** | 73.5**** | 43.1* |
| | Boys | 53.3 | 63.0*** | 77.9**** | 41.5** |
| | Women | 41.8 | 57.2**** | 52.4 | 32.8 |
| | Girls | 48.8 | 56.6** | 54.7 | 37.2 |
| % UNION REPRESENTATION | Men | 36.1 | 70.4**** | 65.0**** | 43.1 |
| | Boys | 26.1 | 40.8**** | 58.5**** | 24.3 |
| | Women | 18.4 | 32.0**** | 15.8 | 13.1 |
| | Girls | 17.6 | 23.7* | 16.2 | 14.2 |
| % FELT DISCRIMINATED BASED ON AGE | Men | 6.1 | 8.7 | 9.9 | 5.4 |
| | Boys | 5.9 | 6.4 | 10.1 | 20.4** |
| | Women | 2.1 | .2**** | 3.5 | 2.9 |
| | Girls | 3.1 | 5.1 | 5.7 | 0 |
| MEAN MILES TRAVELED | Men | 21.1 | 18.9 | 17.0** | 19.0 |
| | Boys | 20.6 | 21.9 | 21.0 | 15.0**** |
| | Women | 14.1 | 13.8 | 11.5* | 11.3* |
| | Girls | NA | NA | NA | NA |
| MEAN HOURS/WK. WORKED | Men | 42.6 | 40.9** | 42.4 | 42.4 |
| | Boys | 41.7 | 35.4**** | 40.1 | 33.3**** |
| | Women | 35.9 | 34.1** | 36.9 | 33.4 |
| | Girls | 36.3 | 29.4**** | 35.6 | 30.9** |
| MEAN YEARS TENURE (MONTHS FOR BOYS AND GIRLS) | Men | 14.7 | 14.7 | 13.3 | 14.3 |
| | Boys | 28.9 | 23.5*** | 26.4 | 15.2**** |
| | Women | 5.9 | 3.9**** | 5.1 | 4.5 |
| | Girls | 22.2 | 16.4**** | 17.8 | 17.2 |

Asterisks indicate significant differences from day shift characteristics.

* p = .1
** p = .05
*** p = .01
**** p = .001

Mean percentages in the table are weighted to adjust for the over-sampling of blacks.

victims of age discrimination more frequently than others in their cohort (20.4 percent as opposed to 5.9 percent for day workers), and among women working evening shifts, who felt themselves discriminated against very much less often than other working women (0.2 percent as opposed to 2.1 percent for day workers).

Men and boys working days traveled an average of twenty-one miles round trip to work while women traveled fourteen. Men and women night shift workers traveled less distance than day workers, but the most significant difference appeared among boys working split shifts, who traveled an average of 5.6 fewer miles than their day-working counterparts.

Women, boys, and girls who worked evenings and boys on split shifts had shorter job tenure than those who worked days, and evening workers in all cohorts had fewer hours per week on the job. Boys and girls working split shifts had significantly fewer average weekly hours as well; there was not, however, any significant difference in number of hours for the night shift workers. It is likely that the lower number of hours for evening workers in all cohorts and boys and girls on split shifts reflected higher numbers of part time workers in these groups.

In addition to occupational distribution the lower wages of evening shift workers might be accounted for by the lower wage rate often received by part time workers. The lower wage rates of the boys and girls may have also been related to the fact that significantly more evening, night and split shift workers were enrolled in school. The enrolled students appear to have taken lower-paying jobs for reasons of convenience.[8]

## SUMMARY

Throughout this study the day workers' characteristics and experience have been taken as the norm, as they far outnumbered workers on other shifts.

Across all cohorts, day workers were in more prestigious and lucrative occupations, which required higher levels of education than the minority who did not work the traditional hours of 9 a.m. - 5 p.m. Evening shift workers were more likely than day workers to have union representation and extra pay for overtime, but these advantages were outweighed by their lower wage occupations and fewer hours of work. Split shift workers also had fewer hours per week and lower wages, although apparently a significant number of young men chose to work split shifts while they were in school. Night shift workers tended to have longer job tenure than those on evening; their job tenure was comparable to that of day workers. While we might have expected to find blacks or the young to predominate among late workers, this was not the case.

Evening, split, and night shift workers were more likely to live in urban areas outside the South, as might be expected from industry distributions; for example, manufacturing, which tended to be on a twenty-four hour schedule, was concentrated in the North. Evening and night shift workers were also often employed in service, wholesale and retail sales, and transportation industries.

Some sex-related differences in shift and industry were observed. Almost no women appeared on any shift in agriculture and construction; transportation and public utilities tended to employ men and boys on the night shift and women and girls on the day shift; wholesale and retail sales industries employed men days and boys, women, and girls in larger than average proportions on evening and split shifts. Finance and insurance industries tended to employ boys, women and girls in the daytime and men on split shifts.

The shift of a worker is tied directly to industry, and more importantly to occupation. Personal and job-related characteristics appear to be related to industry and occupation. Whether people choose or are forced into those occupations which require more shift work is unclear. We, however, anticipate that future transitions of production to late shifts will not be a problem in terms of affecting those groups of workers who are typically disadvantaged in the labor force.

## Footnotes

[1]"6.9 Million Workers on Shifts" (Report #USDOL 78-188) prepared by the U.S. Department of Labor, Office of Information, March 16, 1978.

[2]Other studies which have appeared are John Fenlon, "Recent Trends in Overtime Hours and Premium Pay," Monthly Labor Review, August 1971; J. Carpentiar and P. Cazamian, Night Work, Geneva: International Labour Office, 1977; John Zalusky, "Shift Work - A Complex of Problems, " AFL-CIO American Federationist, May 1978; "6.9 Million Workers on Late Shifts" (Report #USDOL 78-188) prepared by the U.S. Department of Labor, Office of Information, March 16, 1978. The U.S. Department of Labor is currently preparing a more detailed report on shift work based on the Current Population Survey.

[3]These percentages roughly compare to the results obtained in the May 1977 supplement to the Current Population Survey (CPS), as reported in "6.9 Million Workers on Late Shifts." The CPS reported that eighty-four percent of men 55-64 years old, who were nonfarm wage and salary workers working full time, worked the day shift in 1977. Corresponding percentages for the women 35-45 years of age, young men 19-24 and young women 16-34 were eighty-eight, eighty-one and eighty-three percent, respectively. Unlike the CPS data the NLS data includes farm workers and part-time workers. The CPS definition of shifts by hours is similar to the NLS's definition except the CPS has a category defined as "other" which includes a shift that is longer than 12 hours or shorter than 6 hours.

[4]This is especially apparent for wage and Duncan Index. The table below indicates that all cohorts on evening shift had significantly lower wage rates, as did men working nights. As we have seen, evening and night workers are concentrated in service and operative occupations, which are traditionally lower paying. The Duncan Index, a measure of socioeconomic status, showed a consistent pattern of variation across cohorts and across shifts. Evening and night shift workers all had significantly lower scores than their counterparts who worked days.

| | | | | | |
|---|---|---|---|---|---|
| MEAN WAGE | Men | $4.69 | $4.09**** | $3.69**** | $4.32 |
| | Boys | $3.70 | $3.20**** | $3.82 | $2.98**** |
| | Women | $2.95 | $2.66** | $2.88 | $2.58** |
| | Girls | $2.66 | $2.30**** | $2.78 | $2.31** |
| MEAN DUNCAN INDEX | Men | 39.6 | 29.4**** | 26.8**** | 34.0* |
| | Boys | 48.8 | 35.2**** | 35.9**** | 43.3* |
| | Women | 43.0 | 27.4**** | 23.5**** | 39.8 |
| | Girls | 46.9 | 31.5**** | 24.7**** | 41.2* |

[5]In research reported by Zalusky, men who worked the night shift sometimes had domestic problems which were blamed on the difficulty in performing usual domestic roles, the lack of family activity on the weekends and the leisure time falling in midweek. These problems, he reported, tended to be cumulative, generally resulting in decreased marital happiness and, ultimately, divorce. In contrast to the belief that the night shift causes more divorces, the argument can also be made that because the men were not married they were more likely to work the night shifts since this would not cause the same problems as it would for men who were married.

[6]The variable was based on (1) father's educational attainment; (2) mother's educational attainment; (3) occupational status of the father or head of household when the respondent was 14 years old; (4) educational attainment of the respondent's oldest older sibling; and (5) availability of reading material in the home when the respondent was 14. For a more detailed discussion of the socioeconomic variable see the NLS Codebook Supplement, Appendix #10.

[7]The manufacturing industry is also extensively covered by overtime statutes which accounts for larger proportions of evening and night shift workers receiving premium pay for overtime work.

[8]For instance, students may be more concerned about the ability to schedule work hours around classes or the distance traveled to work than the wage rate.

## The Center for Human Resource Research

The Center for Human Resource Research is a policy-oriented research unit based in the College of Administrative Science of The Ohio State University. Established in 1965, the Center is concerned with a wide range of contemporary problems associated with human resource development, conservation and utilization. The personnel include approximately twenty senior staff members drawn from the disciplines of economics, education, health sciences, industrial relations, management science, psychology, public administration, social work and sociology. This multidisciplinary team is supported by approximately 50 graduate research associates, full-time research assistants, computer programmers and other personnel.

The Center has acquired pre-eminence in the fields of labor market research and manpower planning. The National Longitudinal Surveys of Labor Force Behavior have been the responsibility of the Center since 1965 under continuing support from the United States Department of Labor. Staff have been called upon for human resource planning assistance throughout the world with major studies conducted in Bolivia, Ecuador and Venezuela, and recently the National Science Foundation requested a review of the state of the art in human resource planning. Senior personnel are also engaged in several other areas of research including collective bargaining and labor relations, evaluation and monitoring of the operation of government employment and training programs and the projection of health education and facility needs.

The Center for Human Resource Research has received over one million dollars annually from government agencies and private foundations to support its research in recent years. Providing support have been the U.S. Departments of Labor, State, and Health, Education and Welfare; Ohio's Health and Education Departments and Bureau of Employment Services; the Ohio cities of Columbus and Springfield; the Ohio AFL-CIO; and the George Gund Foundation. The breadth of research interests may be seen by examining a few of the present projects.

The largest of the current projects is the National Longitudinal Surveys of Labor Force Behavior. This project involves repeated interviews over a fifteen year period with four groups of the United State population; older men, middle-aged women, and young men and women. The data are collected for 20,000 individuals by the U.S. Bureau of the Census, and the Center is responsible for data anlysis. To date dozens of research monographs and special reports have been prepared by the staff. Responsibilities also include the preparation and distribution of data tapes for public use. Beginning in 1979, an additional cohort of 12,000 young men and women between the ages of 14 and 21 will be studied on an annual basis for the following five years. Again the Center will provide analysis and public use tapes for this cohort.

The Quality of Working Life Project is another ongoing study operated in conjunction with the cities of Springfield and Columbus, in an attempt to improve both the productivity and the meaningfulness of work for public employees in these two municipalities. Center staff serve as third party advisors, as well as researchers, to explore new techniques for attaining management-worker cooperation.

(continued on inside of back cover)

A third area of research in which the Center has been active is manpower planning both in the U.S. and in developing countries. A current project for the Ohio Advisory Council for Vocational Education seeks to identify and inventory the highly fragmented institutions and agencies responsible for supplying vocational and technical training in Ohio. These data will subsequently be integrated into a comprehensive model for forecasting the State's supply of vocational and technical skills.

Another focus of research is collective bargaining. In a project for the U.S. Department of Labor, staff members are evaluating several current experiments for "expedited grievance procedures," working with unions and management in a variety of industries. The procedural adequacies, safeguards for due process, cost and timing of the new procedure are being weighed against traditional arbitration techniques.

Senior staff also serve as consultants to many boards and commissions at the national and state level. Recent papers have been written for the Joint Economic Committee of Congress, The National Commission for Employment and Unemployment Statistics, The National Commission for Manpower Policy, The White House Conference on the Family, the Ohio Board of Regents, the Ohio Governor's Task Force on Health, and the Ohio Governor's Task Force on Welfare.

The Center maintains a working library of approximately 9,000 titles which includes a wide range of reference works and current periodicals. Also provided are computer facilities linked with those of the University and staffed by approximately a dozen computer programmers. They serve the needs of in-house researchers and users of the National Longitudinal Survey tapes.

For more information on specific Center activities or for a copy of the Publications List, write: Director, Center for Human Resource Research, Suite 585, 1375 Perry Street, Columbus, Ohio 43201.